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# घरेलू उपयोग के लिए गैरएलकोहली पेय के सांद्र – विशिष्टि

*Indian Standard*

# NON-ALCOHOLIC BEVERAGE BASES ( CONCENTRATES ) FOR DOMESTIC USE — SPECIFICATION

UDC 663·812

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

*March* 1991

**Price Group 3**

# AMENDMENT NO. 1 FEBRUARY 1995
# TO
# IS 13019 : 1991 NON-ALCOHOLIC BEVERAGE BASES ( CONCENTRATES ) FOR DOMESTIC USE — SPECIFICATION

( *Title* ) — Substitute **'SOFT DRINK CONCENTRATES'** *for* **'NON-ALCOHOLIC BEVERAGE BASES ( CONCENTRATES ) FOR DOMESTIC USE'** in the cover page, Foreword, page 1, Annex D and in the text wherever occurs.

[ *Page* 1, *Table* 1, *Sl No.* (ii), *col* 3 ] — Substitute '8.0' *for* '5.0'.

( *Page* 1, *clause* **4.3.1**, *second line* ) — Substitute '50 per ml' *for* '50 per 100 ml'.

[ *Page* 2, *clause* **6.1**(d) ] — Substitute 'Month and year of manufacture' *for* 'Date of manufacture'.

[ *Page* 2, *clause* **6.1**(e) ] — Substitute 'Best before . . . . . ( Month and year ) . . . . . ' *for* 'Date of expiry'.

( FAD 14 )

Reprography Unit, BIS, New Delhi, India

# AMENDMENT NO. 2 MAY 1996
# TO
# IS 13019 : 1991 SOFT DRINK CONCENTRATES — SPECIFICATION *

( *Foreword* ) — Insert the following matter before the last para:

'A scheme for labelling environment friendly products known as ECO-Mark has been introduced at the instance of the Ministry of Environment and Forests (MEF), Government of India. The ECO-Mark shall be administered by the Bureau of Indian Standards (BIS) under the *BIS Act*, 1986 as per the Resolution No. 71 dated 20 February 1991 and Resolution No. 425 dated 28 October 1992 published in the Gazette of the Government of India. For a product to be eligible for marking with the ECO-Mark it shall also carry the Standard Mark of BIS for quality besides meeting additional environment friendly (EF) requirements. The environment friendly requirements for soft drink concentrates are, therefore, included through Amendment No. 2 to this standard.

This amendment is based on the Gazette Notification No. 624 (E) dated 6 September 1995 for Labelling Beverages, Infant Foods, Processed Fruits and Vegetable Products as environment friendly, published in the Gazette of the Government of India.'

( *Page* 1, *clause* 4.4 ) — Insert the following new matter after 4.4:

"**4.5 Additional Requirements for ECO-Mark**

4.5.1 *General Requirements*

**4.5.1.1** The product shall conform to the requirements prescribed under 4.1 to 4.4.

**4.5.1.2** The manufacturer shall produce the consent clearance as per the provisions of *Water (PCP) Act*, 1974, *Water (PCP) Cess Act*, 1977 and *Air (PCP) Act*, 1981 along with the authorization if required under *Environment (Protection) Act*, 1986 and the Rules made thereunder to the Bureau of Indian Standards while applying for the ECO-Mark and the product shall also be in accordance with the *Prevention of Food Adulteration Act*, 1954 and the Rules made thereunder. Additionally, FPO 1955 (Fruit Product Order) framed under *Essential Commodities Act*, 1955, *Standards of Weights and Measures Act*, 1977 requirements wherever applicable has to be complied with.

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*Title changed from 'Non-alcoholic Beverage Bases ( Concentrates ) for Domestic Use — Specification' vide Amendment No. 1, February 1995.

**4.5.1.3** The product/packaging may also display in brief the criteria based on which the product has been labelled environment friendly.

**4.5.1.4** The material used for product packing shall be recyclable or biodegradable.

**4.5.1.5** The date of manufacture and date of expiry shall be declared on the product package by the manufacturer.

**4.5.1.6** The product shall be microbiologically safe when tested as per IS 5403 : 1969 'Method for yeast and mould count of foodstuffs' and IS 5887 ( Part 5 ) : 1976 'Methods for detection of bacteria responsible for food poisoning : Part 5 Isolation, identification and enumeration of *Vibrio Cholerae* and *Vibrio Parahaemolyticus* ( *first revision* )' and shall be free from bacterial and fungal toxins.

**4.5.1.7** The pesticide residues, if any in the product shall not exceed the limit as prescribed in *PFA Act*, 1954 and the Rules made thereunder.

**4.5.1.8** The product/package or leaflet accompanying it may display instructions of proper use, storage and transport (including refrigeration temperature compliance) so as to maximize the product performance, safety and minimize wastage.

**4.5.2** *Specific Requirements*

**4.5.2.1** Arsenic content of the product shall not exceed 0.1 mg/kg when tested in accordance with the method given in IS 11124 : 1984 'Method for atomic absorption spectrophotometric determination of arsenic'.

**4.5.2.2** The material used inside the metal cap of the product shall conform to the relevant Indian Standards of food grade plastics as permitted under the *Prevention of Food Adulteration Act*, 1954 and the Rules made thereunder. Caps and closures shall not be treated as labels.

**4.5.2.3** The percentage of fruit juice/pulp, if any added shall be mentioned on the product/package.

**4.5.2.4** No synthetic food colour and artificial sweetener shall be added or used in the product."

( *Page* 2, *clause* **6.1** ) — Insert the following new clause after **6.1(k)**:

'**6.2 ECO-Mark**

The product may also be marked with the ECO-Mark, the details of which may be obtained from the Bureau of Indian Standards.'

( FAD 14 )

Reprography Unit, BIS, New Delhi, India

**Drinks and Carbonated Beverages Sectional Committee, FADC 14**

## FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Drinks and Carbonated Beverages Sectional Committee had been approved by the Food and Agriculture Division Council.

Non-alcoholic beverage bases ( concentrates ) are used in the preparation of syrup and then beverages at homes by adding the same to a fixed-volume solution of sugar in potable water with or without carbonation. For the purpose of preparing the sugar solution, a fixed amount of sugar is added to a particular volume of water, as declared by the manufacturer.

In the preparation of this standard, due consideration has been given to the *Prevention of Food Adulteration ( PFA ), Act*, 1954 and the Rules framed thereunder. This standard is subject to the restrictions imposed under these Rules, wherever applicable.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values ( *revised* )'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Indian Standard*

# NON-ALCOHOLIC BEVERAGE BASES ( CONCENTRATES ) FOR DOMESTIC USE — SPECIFICATION

## 1 SCOPE

**1.1** This standard prescribes the requirements and the methods of sampling and test for non-alcoholic beverage bases ( concentrates ) for domestic use.

## 2 REFERENCES

**2.1** The Indian Standards listed in Annex A are necessary adjuncts to this standard.

## 3 INGREDIENTS

**3.1** All ingredients as permitted under the *Prevention of Food Adulteration Act*, 1954 and Rules framed thereunder may be used.

## 4 REQUIREMENTS

### 4.1 Physical Requirements

**4.1.1** *Description*

The material shall be either in solid and/or liquid forms.

**4.1.2** The solid material shall be granular to fine crystalline powder devoid of lumps and free from foreign materials. It shall be soluble in water at 27 ± 2°C temperature when dissolved as per the directions for use.

**4.1.3** The liquid material shall be clear or cloudy, free from scum, residue or suspended matter, of a uniform colour, and with or without flavour. It shall be free from bad flavours and odours.

### 4.2 Chemical Requirements

**4.2.1** The concentrate, in solid form, shall also conform to the requirements given in Table 1.

**Table 1 Requirements for Solid Concentrates**

| Sl No | Characteristics | Requirement | Method of Test, Ref to | |
|---|---|---|---|---|
| | | | Annex of this Standard | Cl No of IS 1699 1974 |
| (1) | (2) | (3) | (4) | (5) |
| i) | Water insoluble matter percent by mass, *Max* | 1.0 | — | 5 |
| ii) | Moisture content, percent by mass *Max* | 5.0 | B | — |
| iii) | Sulphated ash, percent by mass, *Max* | Value as declared by the manufacturer | C | — |
| iv) | Lead ( as Pb ), mg/kg, *Max* | 2.0 | — | 9 |
| v) | Arsenic ( as As ), mg/kg, *Max* | 3.0 | — | 10 |
| vi) | Copper ( as Cu ), mg/kg *Max* | 20.0 | — | 11 |

**4.2.2** The concentrate, in liquid form, shall conform to the requirements given in Table 2.

**Table 2 Requirements for Liquid Concentrates**

| Sl No. | Characteristics | Requirement | Method of Test, Ref to | |
|---|---|---|---|---|
| | | | Annex of this Standard | Cl No of IS 1699 : 1974 |
| (1) | (2) | (3) | (4) | (5) |
| i) | Water insoluble matter, percent by mass, *Max* | 1.0 | — | 5 |
| ii) | Lead ( as Pb ), mg/kg *Max* | 2.0 | — | 9 |
| iii) | Arsenic ( as As ), mg/kg, *Max* | 3.0 | — | 10 |
| iv) | Copper ( as Cu ) mg/kg, *Max* | 20.0 | — | 11 |

### 4.3 Microbiological Requirements

**4.3.1** The total plate count shall not be more than 50 per 100 ml, when tested by the method prescribed in IS 5402 : 1969.

**4.3.2** The coliform count shall be zero in 100 ml, when tested by the method prescribed in IS 5401 : 1969.

**4.3.3** The yeast and mould counts shall not be more than 2 per ml when tested by the method prescribed in IS 5403 : 1969.

### 4.4 Hygienic Conditions

The concentrate shall be manufactured under hygienic conditions ( *see* IS 2491 : 1972 ).

## 5 PACKING

**5.1** The solid material shall be packed in polyesterised metallic pouches lined internally with low density polyethylene ( LDPE ) or in glass bottles of suitable quality. The suitability of plastics shall be established with reference to IS 10171 : 1987.

**5.2** The liquid material shall be packed in glass vials or bottles or food grade plastic bottles/pouches fitted with rubber or plastic stoppers. The rubber stoppers shall conform to IS 3692 : 1975. The suitability of plastics shall be established with reference to IS 10171 : 1987.

**5.3** The solid and the liquid material packed in a pouch/glass bottles or vials/plastic bottles shall

**be further packed in suitable packages as agreed to between the purchaser and the supplier.**

## 6 MARKING

**6.1** Each container shall be suitably marked to bear the following particulars:

a) Name of the material;
b) Indication of the source of manufacture;
c) Name of the flavour;
d) Date of manufacture;
e) Date of expiry;
f) Batch number;
g) Net mass of contents;
h) List of ingredients,
j) Directions for use, and
k) Any other details, required under the *Standards of Weights and Measures ( Packaged Commodities ) Rules*, 1977 and the *Prevention of Food Adulteration Act*, 1954 and the Rules framed thereunder.

## 7 SAMPLING

**7.1** The scale of sampling and criteria for conformity of a lot to the requirements of this standard shall be as given in Annex D.

## 8 TESTS

**8.1** Tests shall be carried out as prescribed in col 4 and 5 of Table 1 and in **2**, **4.1.2**, **4.1.3**, **4.3.1**, **4.3.2** and **4.3.3**

# ANNEX A

( *Clause* 2.1 )

## LIST OF REFERRED INDIAN STANDARDS

| *IS No.* | *Title* |
|---|---|
| 1699 : 1974 | Methods of sampling and test for food colours ( *first revision* ) |
| 2491 : 1972 | Code for hygienic conditions for food processing units ( *first revision* ) |
| 3692 : 1975 | Rubber closures, pharmaceutical ( *first revision* ) |
| 5401 : 1969 | Methods for detection and estimation of coliform bacteria in foodstuffs |
| 5402 : 1969 | Method for standard plate count of bacteria in foodstuffs |
| 5403 : 1969 | Method for yeast and mould count of foodstuffs |
| 10171 : 1987 | Guide on suitability of plastics for food packaging ( *first revision* ) |

# ANNEX B

[ *Table* 1, *Sl No.* (ii) ]

## DETERMINATION OF MOISTURE CONTENT

### B-1 DEAN AND STARK METHOD

**B-1.1 General**

Dean and Stark method may be followed for the determination of moisture content

**B-1.2 Apparatus**

**B-1.2.1** *Distillation Flask*

Made of hard glass of 500-ml capacity and provided with a ground-glass joint.

**B-1.2.2** *Reflux Condenser*

Made of glass, water cooled, having the outside diameter of the inner tube 16-17 mm, and that of the jacket 23 to 25 mm. The lower end of the condenser is provided with a ground-glass cone. The tip of the condenser is ground at an angle of approximately 30° from the vertical axis.

**B-1.2.3** *Receiver ( or Trap )*

Made of hard glass and consisting essentially of an upper chamber, provided with a side-arm leading to the distillation flask, and a cylindrical graduated portion, the lower end of which is sealed. The opening of the upper chamber is provided with a ground-glass socket, fitting the cone of the condenser. The lower end of the side-arm is provided with a ground-glass cone fitting the socket of the distillation flask. The graduated portion has a capacity of 5 ml when filled to the highest graduation mark. The scale covers the range 0 to 5 ml, with graduation marks at 0·1 ml intervals. The error at any indicated capacity should not exceed 0·02 ml.

**B-1.2.4** *Heat Source*

Either an oil bath or an electric heater provided with a sliding rheostat or other means of heat control. The temperature of the oil in the bath should not be very much higher than the boiling point of petroleum naphtha.

**B-1.2.5** *Copper Wire*

Long enough to extend through the condenser with one end twisted into a spiral. The diameter of the spiral should be such that it fits snugly with the graduated portion of the receiver and yet can be moved up and down

**B-1.3 Reagents**

**B-1.3.1** *Chromic Acid Cleaning Solution*

**B-1-3.2** One of the following solvents may be used:

a) *Petroleum naphtha* — with a boiling range of 90 to 210°C,

b) *n-Heptane* — boiling point around 98°C, and

c) *Toluene* — boiling point around 110°C.

**B-1.4 Procedure**

Clean the entire apparatus with chromic acid solution to minimize the adherence of water droplets to the sides of the condenser and the receiver. Rinse thoroughly with distilled water and dry completely before using.

Place an appropriate amount of the sample accurately weighed into the distillation flask. The amount of sample taken should be such that the distillation flask is not more than one-third full; it should not contain more than 1·8 ml of water. Add sufficient volume of the solvent ( 100 to 200 ml ) so that the sample shall be completely covered by the solvent while distillation is in progress. Swing to mix and add pumice stone to ensure speedy boiling. Assemble the apparatus and fill the receiver with the solvent by pouring the solvent through the condenser until it begins to overflow into the distillation flask. Attach a guard tube containing anhydrous calcium chloride at the top of condenser to prevent condensation of atmospheric moisture within the tube In order that the refluxing may be under control, wrap the distillation flask and the tube leading to the receiver with asbestos fibre. Heat the flask till about 100 drops are distilled over, increase the distillation rate to about 200 drops/minute and continue heating until no more water is collected. Purge the condenser occasionally during the distillation with 5-ml portions of solvent in order to wash down any moisture adhering to the walls of the condenser. The water in the trap may be made to separate from the solvent by means of a copper wire, one end of which is twisted into a helix. The copper wire if moved up and down in the condenser and receiver occasionally causes the water to settle down at the bottom of the trap. Reflux until the water level in the receiver remains unchanged for 30 minutes and then shut off the source of heat. Flush the condenser with the solvent, making use of the copper wire to disengage any moisture droplets. Allow to stand for about 15 minutes and then read the volume of water.

**B-1.5 Calculation**

$$\text{Moisture content, percent by mass} = \frac{100\,V}{M}$$

where

$V$ = volume, in ml, of water collected; and

$M$ = mass, in g, of the material taken for the test.

**B-1.6 Precision**

The results of a duplicate determination of moisture content of the material, percent by mass, should not vary by more than ± 0·5 from that of the first determination.

## ANNEX C

[ *Table* 1, *Sl No.* (iii) ]

## DETERMINATION OF SULPHATED ASH

### C-1 OUTLINE OF THE METHOD

**C-1.1** A known quantity of the material is ignited and burnt until only ash and carbon remain. After cooling, the residue is moistened with sulphuric acid, ignited and finally the weight of sulphate ash is determined.

### C-2 APPARATUS

**C-2.1 Crucible** — silica or platinum.

### C-3 PROCEDURE

**C-3.1** Weigh accurately about 5 g of the material in the tared crucible and dry at 105 ± 2°C for four hours. Moisten with 2 to 3 drops of sulphuric acid, ignite gently until the carbon is completely consumed. Moisten again with a drop or two of water and then carefully with 2 to 3 drops of sulphuric acid. Re-ignite. Conduct the ignition in a place protected from air currents, and use as low a temperature as possible to effect the combustion of the carbon. When the carbon has completely disappeared, continue heating till no more sulphuric acid fumes are evolved. Cool the crucible and weigh.

**C-4 CALCULATION**

$$\text{Sulphated ash, percent by weight} = \frac{100\,W_1}{W_2}$$

where

$W_1$ = weight, in g, of the residue after ignition; and

$W_2$ = weight, in g, of the material taken for the test

## ANNEX D

( *Clause* 7.1 )

### SCALE OF SAMPLING AND CRITERIA FOR CONFORMITY FOR NON-ALCOHOLIC BEVERAGE BASES ( CONCENTRATES ) FOR DOMESTIC USE

**D-1 SCALE OE SAMPLING**

**D-1.1 Lot**

The quantity of packed non-alcoholic beverage bases of the same type and belonging to the same batch of manufacture shall constitute a lot.

**D-1.2** For ascertaining the conformity of the material to the requirements of the relevant specification, samples shall be tested from each lot separately.

**D-1.3** The number of items ( pouches/glass bottles or vials/plastic bottles, as the case may be ) to be selected from a lot shall depend upon the size of the lot and shall be according to Table 3.

**Table 3 Scale of Sampling**

| No of Items in the Lot (1) | No of Items to be Selected (2) |
|---|---|
| Up to 1 000 | 5 |
| 1 001 to 5 000 | 10 |
| 5 001 to 10 000 | 15 |
| 10 001 to 15 000 | 20 |
| 15 001 and above | 25 |

**D-1.4** The items shall be selected at random from the lot. In order to ensure the randomness of selection, procedures given in IS 4905 : 1968 may be followed.

**D-1.5** From each of the items selected, a representative portion of the material sufficient for carrying out triplicate tests for all characteristics shall be taken.

**D-1.6** Out of these portions, a small but approximately equal quantity of material shall be taken and thoroughly mixed to form a composite sample. The composite sample shall be divided into three equal parts, one for the purchaser, another for the supplier and the third for use as referee sample.

**D-1.7 Individual Samples**

The remaining portion of the material from each item shall be divided into three equal parts and transferred to separate containers with full identification particulars. The material in each container shall constitute an individual sample. One set of containers of individual samples shall be marked for the purchaser, another for the supplier and the third as referee sample.

**D-1.8** The referee samples consisting of a composite sample ( *see* **D-1.6** ) and a set of individual samples ( *see* **D-1.7** ) shall bear the seales of both the purchaser and the supplier and kept at a place mutually agreed to between them

**D-1.9 Number of Tests**

Tests for moisture ( for solid concentrates ) and water insoluble matter shall be made on each of the individual samples ( *see* **D-1.7** ) while tests for all other characteristics shall be made on the composite sample ( *see* **D-1.6** ).

**D 1.10 Criteria for Conformity**

**D-1.10.1** *Individual Samples*

From the test results for each characteristics tested on individual samples, the average ($\bar{X}$) and the range ($R$) if sample size is less than 10 or average range ($\bar{R}$) if sample size is greater than or equal to 10, shall be calculated from test results

$$\text{Average } (\bar{X}) = \frac{\text{Sum of all the test results}}{\text{Number of test results}}$$

Range ($R$) = Difference between maximum and minimum test results

NOTE — For sample size 10 or more, range is calculated for 5 test results taken in the order in which they are obtained and then average range ($\bar{R}$) is computed

The lot shall be considered to have met the requirements for these characteristics if ( $\bar{X} + 0{\cdot}6\ R$ ) or ( $\bar{\bar{X}} + 0{\cdot}6\ \bar{R}$ ) is equal to or less than the maximum specified limit, for each of these characteristics.

**D-1.10.2** *Composite Samples*

In respect of each characteristic tested on the composite sample, the lot shall be declared to meet the requirement if the test result on the composite sample satisfies the corresponding requirements.

**D-1.10.3** The lot shall be declared as conforming to the requirements of this standard if **D-1.10.1** and **D-1.10.2** are satisfied.

**Standard Mark**

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

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